2015 Fire Weather Program Annual Summary

Covering Central and Northeast Oregon, South Central and Southeast Washington

Prepared by Rachel Cobb
Fire Weather Program Leader
National Weather Service, Pendleton, Oregon

Canyon Creek Complex tanker drop August 26, 2015. Photo Credit: Tina O'Donnell, ODF

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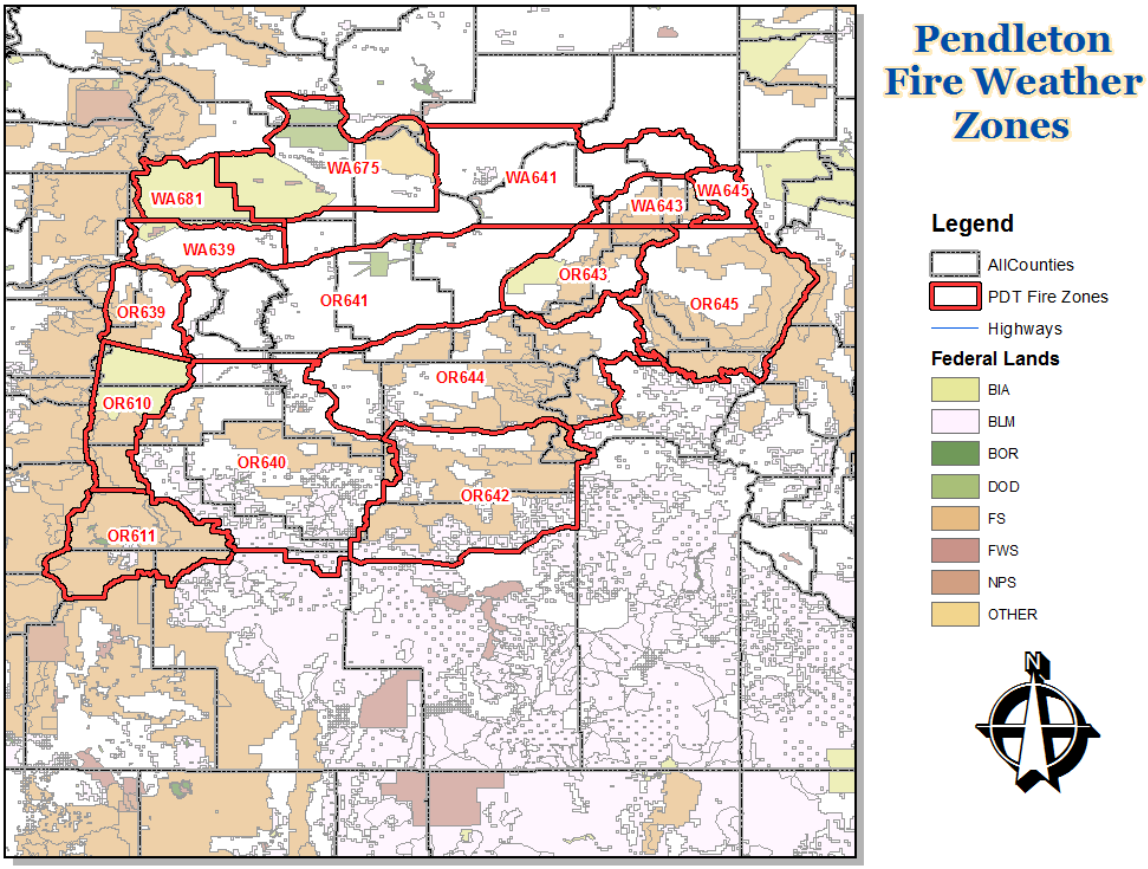
Fire Weather Zone Map with Federal Land Ownership



Fire Activity Summary

Fire season in the interior Pacific Northwest began around June 16th, which was about two weeks earlier than usual. This was preceded by a very dry spring with below normal precipitation amounts and an ongoing drought. But as usual, the greatest activity was seen in July and August and diminished in September. The season ended October 28th. In 2015, there were 4602 wildfires in Washington and Oregon for 1,823,470 acres burned. Over 500,000 acres burned were located in the Pendleton National Weather Service's local area of responsibility. These statistics represent wildfires that burned about 25% more land in 2015 as compared to 2014.

One of the first large fires to occur in the local area was the Highway 97 #1 Fire six miles south of Toppenish, WA on the Yakama Reservation June 21st through 26th. This 1200 acre brush fire caused up to 12 miles of highway to be closed for several days. Then June 27th through 29th, fifteen miles southeast of Kennewick, WA, several more brush fires along the Columbia River burned 2853 acres. These fires, which included the LesBlair and Berrian fires, came to be known as the SE Benton Complex.

Also on June 27th, thunderstorms across central Oregon ignited the Sugarloaf and Schoolhouse Gulch fires near Dayville, OR. Another round of storms on June 28th in the same area was responsible for starting the West Fork and Corner Creek fires. Then on June 29th, an outhouse near the Sugarloaf Fire was set ablaze by an errant human, and the Blue Basin Fire began. Very hot and dry and occasionally windy conditions followed the convective activity and these fires grew quickly, consuming private and public land that included portions of the Malhuer and Ochoco National Forests, the John Day Fossil Beds National Monument, and Prineville BLM lands. Additionally, one structure was lost in the Sugarloaf Fire and one was also lost in the Corner Creek Fire. The Sugarloaf Fire eventually burned 4740 acres, the Schoolhouse Gulch Fire 102 acres, and the Blue Basin Fire 317 acres, and all were contained by July 10th. The Corner Creek fire burned 29,660 acres and was not contained until the end of July, while the West Fork Fire only burned 928 acres, but was not listed as contained until the second half of September.

Several other smaller lightning fires began in central Oregon on June 29th. The Harper Complex, which consisted of three fires nine miles west of John Day, burned 442 acres, and the Jones Canyon Fire, thirteen miles northeast of Monument, burned 840 acres. Then on July 1st, lightning started the Dennis Creek Fire, fifteen miles east of Union, OR in the Eagle Cap Wilderness, which burned 157 acres. Very hot and dry conditions on July 2nd then contributed to large brush fires in Washington. The Junction Fire fifteen miles south of Goldendale burned 2,100 acres and took one home, one apartment, one hay barn, and seven other outbuildings. The nearby Viewpoint Fire burned at the same time, consuming an additional 1,025 acres. Two more large brush fires started in Washington on July 5th. The Gilmore Gulch Fire burned 9,859 acres six miles northeast of Anatone, and the Inc. 483 Fire burned 130 acres five miles southwest of Asotin. July 8th through 12th, ten miles west of Antelope, OR, a human caused brush fire dubbed the Ten Mile Canyon Fire, burned 6,707 acres of Prineville BLM land. Also on Prineville BLM land, the Geneva 15 Fire, five miles west of Culver, burned 875 acres between July 10th and 14th, and prompted evacuations near Lake Billy Chinook.

On July 20th the human caused Blue Creek Fire began ten miles east of Walla Walla, WA and threatened the Mill Creek Watershed. This fire burned 6,004 acres and destroyed one primary structure and eleven outbuildings before it was contained on August 4th. Then on July 23rd,

lightning started the Rye Fire which consumed 763 acres of brush and grass thirteen miles northwest of Flora, OR. There was another grass fire that began on July 24th, fifteen miles north of Helix, OR in Walla Walla County, which was dubbed the Hatch Grade Fire and burned 600 acres. Also on July 24th, the human caused Oak Canyon Fire, nine miles southeast of Dufur, OR, started on private land and burned onto Prineville BLM lands, scorching 930 acres before it was contained on July 28th. Another human caused fire was started by an abandoned campfire on August 1st seven miles northwest of Elgin, OR. This fire became known as the Phillips Creek Fire and burned 2,601 acres of the Umatilla National Forest and ODF protected lands before being contained on August 20th. During this period, the Highway 8 Fire was active August 4th through 10th. This very large fire burned 33,100 acres and prompted evacuation of the entire city of Roosevelt, WA.

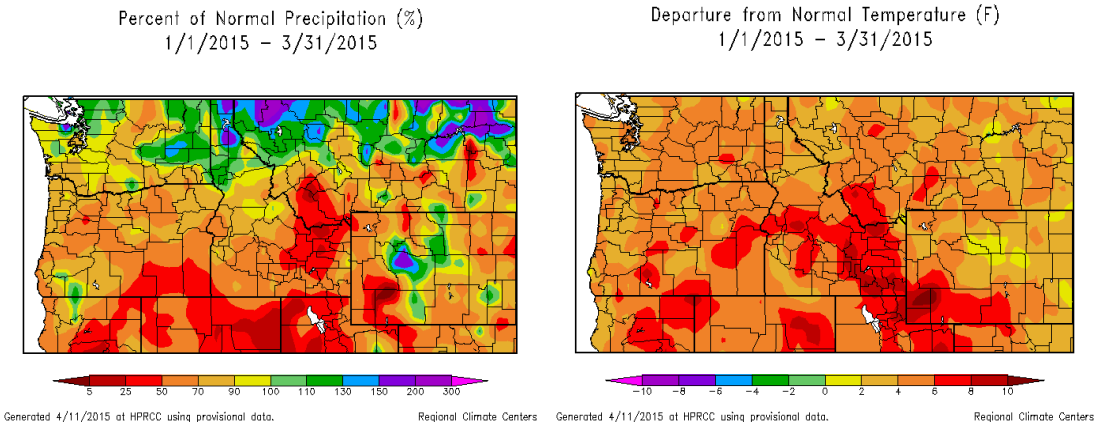
Beginning August 10th numerous thunderstorms with abundant lightning started several very large wildfires. These storms were followed by a period of very dry and windy conditions that severely tested already strained firefighting resources. The Cougar Creek Fire, which began on August 10th six miles northwest of Glenwood, WA, consumed 54,000 acres on the east slopes of Mount Adams and the Yakama Reservation before containment of September 15th. Then on August 11th, the Eagle Complex of fires began twenty miles northwest of Richland, OR. These fires burned in the Wallowa Whitman National Forest and ODF protected lands. It took one structure and 12,763 acres, and was not listed as contained until November 2nd. The most devastating incident began on August 12th with the Mason Springs and Berry Creek fires south of John Day, OR. These were only two of twelve new starts in this area, but the fires grew rapidly due to strong winds and combined to form the Canyon Creek Complex. These fires burned in the Malhuer National Forest, and on BLM and private lands. Numerous evacuations were ordered as firefighters struggled to control the blazes. A total of 110,261 acres were lost and 53 structures, including many homes. This complex was not completely contained until November 5th. The County Line 2 Fire also began on August 12th, but was human caused. This fire burned 67,207 acres on the Warm Springs Reservation, took seven structures, and prompted the evacuation of the Kah-Nee-Ta Resort. Then on August 13th, The Grizzly Bear Complex began due to lighting in the Umatilla National Forest in both Oregon and Washington. This began as eighteen fires that mostly burned together to consume 82,659 acres and take 35 structures. This complex was not fully contained until October 21st. Also starting on August 13th was the human caused Lost Valley Fire eight miles southwest of Lonerock, OR on private lands. Fortunately, despite low humidity and strong winds, this fire was contained quickly and only 143 acres were burned.

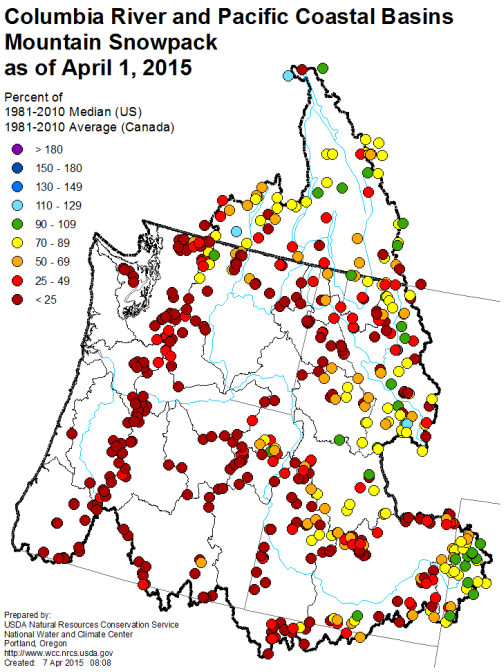
Another fire began in the Umatilla National Forest on August 16th and became the Turner Basin Fire eight miles east of Dale, OR. However, this fire only burned 69 acres and was contained by August 31st. The even smaller Johnson Fire began on August 17th twelve miles east of Long Creek, OR, but only claimed 23 acres. Then on August 22nd the Falls Creek Fire began in the Eagle Cap Wilderness and went on to consume 396 acres. And on August 29th, the Tucannon Fire, 20 miles east of Dayton, WA, was started and moved fast in steep terrain to burn 2,630 acres before containment on September 3rd. Another Prineville BLM grass fire burned from September 9th through 13th three miles east of Maupin, OR. This fire was named the Oven Fire and burned 1,100 acres. Lastly, on September 13th, two large, human caused brush fires began in Washington. The Stateline Fire six miles south of Wallula burned 9,759 acres, and the Horsethief Butte Fire four miles west of Wishram burned 7,960 acres. The Horsethief Butte fire also prompted the evacuation of the entire town of Wishram, and took seven structures, but they were mainly outbuildings.

Weather Review

Winter (January – March)

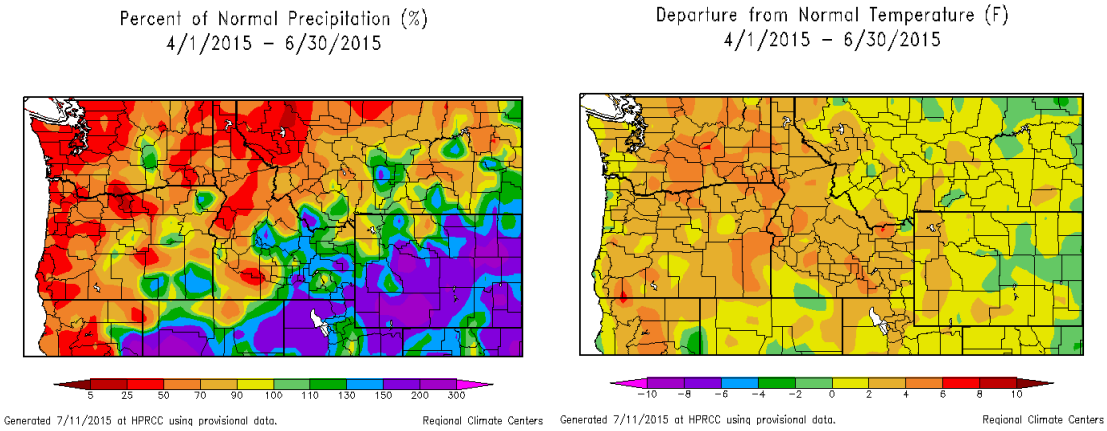
Precipitation amounts were below normal across all of eastern Oregon and most of south-central and southeast Washington during the second half of winter. In association with this trend, temperatures were well above normal across the entire region during this period. High pressure was over the area during much of the period and many locations experienced record warmth each month. Precipitation was below normal during January and only improved to near normal in February, despite an atmospheric river event at the beginning of the month. March was characterized by below normal precipitation and significantly below normal snowpack. By April 1st, many mountain snowfall reporting stations across Oregon and southeast Washington had less than 25 percent of average snowpack. Normal values for precipitation and temperature are from the 1981-2010 period of record.

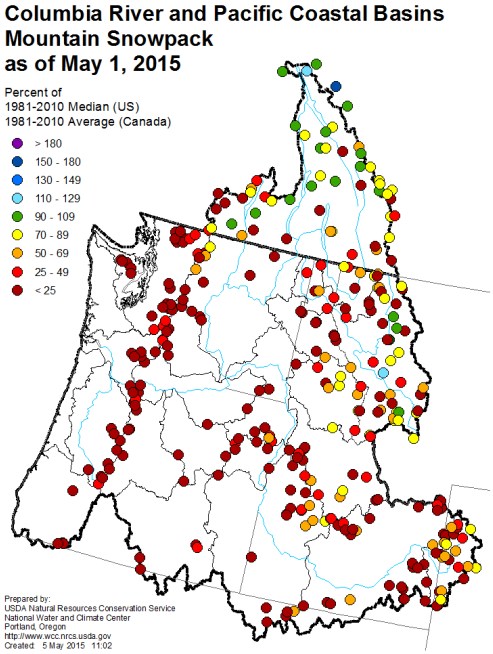




Spring Prescribed Burn Season (April – June)

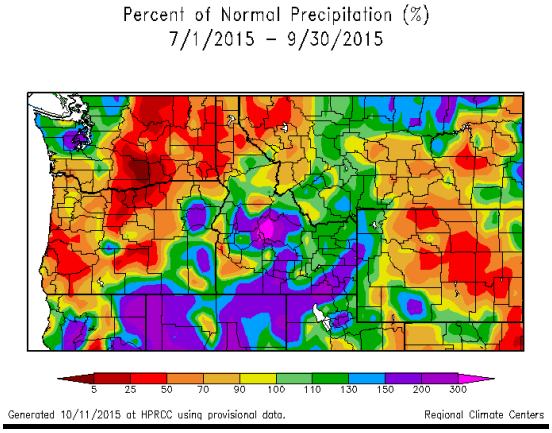
In the spring, precipitation continued to be below normal and temperatures above normal across much of the area. Snowpack therefore remained very low. Temperatures were actually near normal in April with the region under a zonal flow aloft, but the storm track did not favor the local area and many lowest precipitation records were set. Dry weather persisted at the beginning of May, but then there was a pattern shift and several wet weather systems moved through the region, including severe thunderstorm events at the end of the month. This finally brought a period of above normal precipitation, but temperatures also increased and more records for warmth were set. June could be characterized as hot and dry. A strong ridge of high pressure allowed temperatures to soar above 100 degrees for several days during the second week of the month, and many more records were set for warmth and dryness. There were, however, thunderstorms towards the end of June that sparked wildfires in central Oregon.

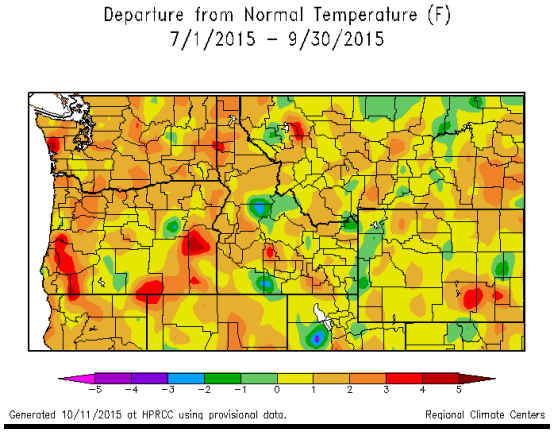




Summer Peak Fire Season (July – September)

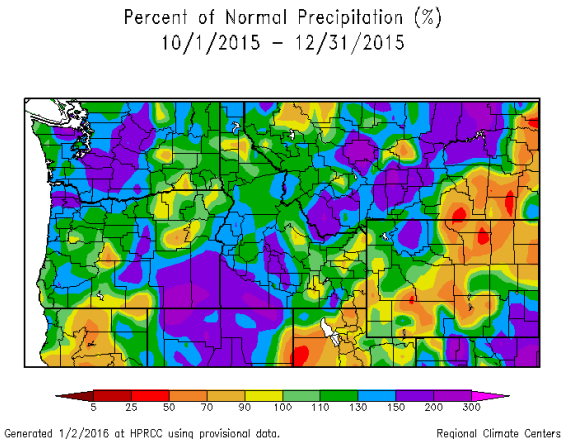
Drought continued through the summer of 2015 with below normal precipitation and above normal temperatures. Hot and dry conditions persisted through much of July and August and several more records were set. Although a few locations did see above normal precipitation amounts due to thunderstorms, this also brought lightning that ignited devastating wildfires. There was also a significant dry frontal passage on August 14th that brought blowing dust and pushed wildfires beyond the control of firefighters. Temperatures finally moderated in September and averaged near to slightly below normal for the month. Yet some areas remained very dry, especially along the east slopes and just east of the Cascades, while the Blue Mountain Foothills and eastern mountains saw wetting rains.

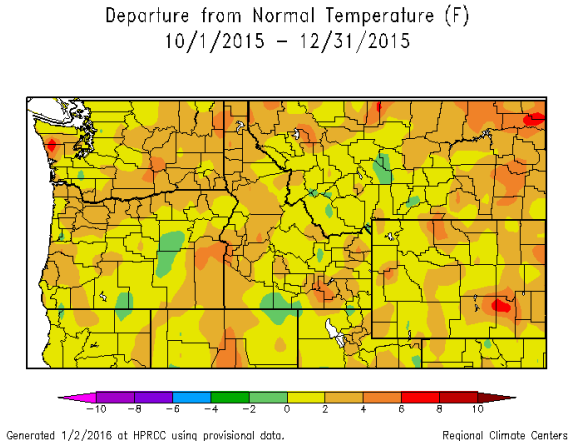




Fall Prescribed Burn Season (October – December)

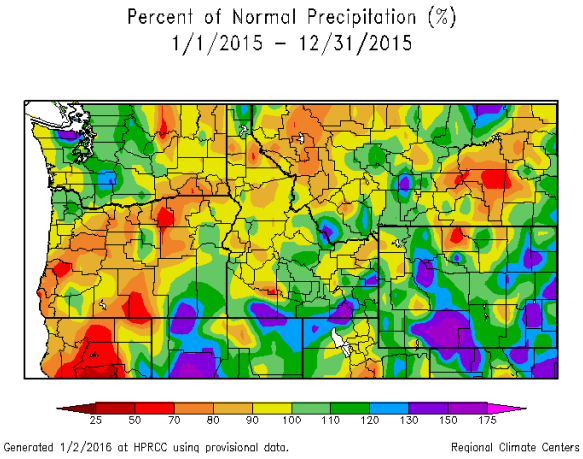
Temperatures remained above normal through the fall burning season, but many areas also received above normal precipitation. October began dry with high pressure and record high temperatures. Wet weather arrived the last week of October, and occasional weather systems displaced a high pressure ridge in November and December bringing rain and snow, yet the Blue Mountains foothills and some portions of eastern Oregon were still drier than normal. Moderate prescribed burning continued through October, and then ended in the middle of November.

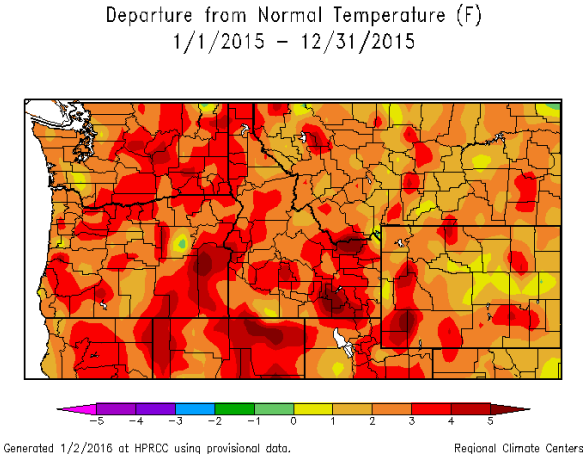




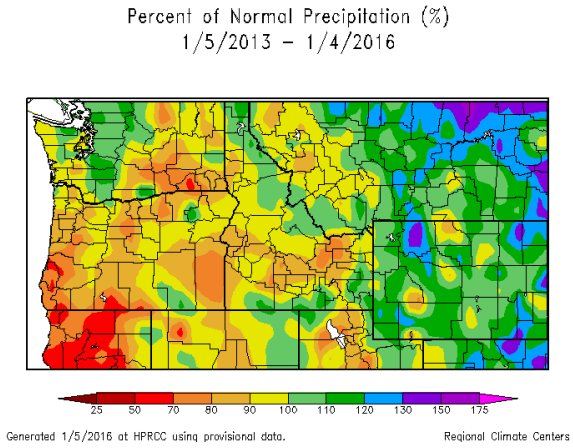
End of Year Conditions

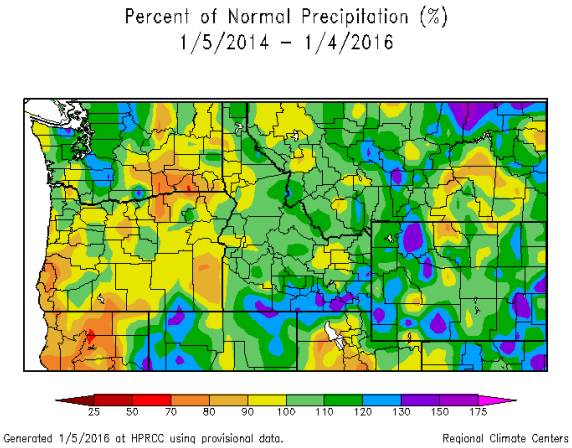
The images below provide a 12-month precipitation and temperature summary ending December 31, 2015. There were a few moist weather systems that moved through the region during the year that lead to above normal precipitation over the Washington Cascades, but most locations continued to be drier than normal. As has been seen in recent years across many parts of the county, most of the Pacific Northwest had above normal temperatures. The warm conditions and numerous lightning events that occurred this past summer contributed to another very active wildfire season.





Despite very wet storm systems associated with atmospheric rivers over the last several years, many areas are still drier than normal. Because of this, NOAA's Climate Prediction Center still considers central and northeast Oregon in a moderate to severe drought, and southeast Oregon in an extreme drought. Washington's situation is not as dire, but portions of southeast Washington rang from abnormally dry to severe drought. Fortunately, the last 24 months (right image below) have not been as dry as the last 36 months (left image below). This could be indicative of a moistening trend that could bring the region back to near normal precipitation amounts going into 2016.





Number of Forecasts Issued

Month	Fire Weather Planning[1]	Spot Forecast			Red Flag Events		On Site IMET	NFDRS Forecasts	Air Transport & Stability[1]
		Prescribed	Wildfire	HAZMAT, Search/ Rescue, & Drill Support	Fire Weather Watch	Red Flag Warning			
Jan	0	0	0		0	0	0	0	31
Feb	0	8	0	2(H&D)	0	0	0	0	28
Mar	14	35	0		0	0	0	6	32
Apr	42	49	0		0	0	0	21	37
May	54	34	5		0	0	0	28	51
Jun	71	18	39		7	23	2	30	47
Jul	68	1	62		12	33	21	31	56
Aug	77	4	92		20	52	31	30	42
Sep	62	10	45	1(SAR)	0	3	0	30	36
Oct	48	76	46		0	0	0	24	55
Nov	0	14	0		0	0	0	0	48
Dec	0	0	0		0	0	0	0	49
Total	**436**	**249**	**289**	**3**	**39**	**108**	**54**	**200**	**512**

[1] Includes non-routine forecast updates

Red Flag Warning Events and Verification

Date	Zones	Reason	Verification	Lead Time
June 9-10	WA639, WA675, OR639, OR611, OR640, OR641	Wind/Low RH	No – OR611 Yes – All others	26.75 hrs.
June 10-12	OR610, OR611	Wind/Low RH	Yes	24.39 hrs.
June 16-18	OR639, OR641, WA639, WA641, WA675	Wind/Low RH	Yes	32.30 hrs.
June 26-29	All	Abundant Lightning	Yes – OR611, OR640, OR641, OR642, OR643, OR645 No – All others Missed Event – OR639, OR640, WA639, WA681	13.25 hrs.
July 2-4	OR610, OR639, OR640, OR641, WA639, WA675	Wind/Low RH	No – OR640 Yes – All others	27.74 hrs.
July 6-7	OR610, OR611, OR640, OR642	Abundant Lightning	Yes	15.16 hrs.
July 9	OR611, OR640, OR641, OR642, OR643, OR644, OR645, WA643, WA645	Abundant Lightning	No – WA645, OR640 Yes – All Others	25.73 hrs.
July 15	WA675	Wind/Low RH	Yes	8.42 hrs.
July 19	OR610, OR639, WA639, OR641	Wind/Low RH	No – OR610, OR641 Yes – OR639, WA639	7.68 hrs.
July 20-21	OR639, OR641, WA639, WA641, WA675	Wind/Low RH	Yes	26.40 hrs.
July 23	OR645	Abundant Lightning	Missed Event	
July 30-August 1	WA639, WA641, WA643, OR611, OR639, OR640, OR641, OR642	Haines 6/Low RH Abundant Lightning – OR611	No – OR611 Yes – All Others	12.98 hrs.
August 3	OR611, OR640	Abundant Lightning	Yes – OR640 No and Missed Event – OR611	0.0 hrs.

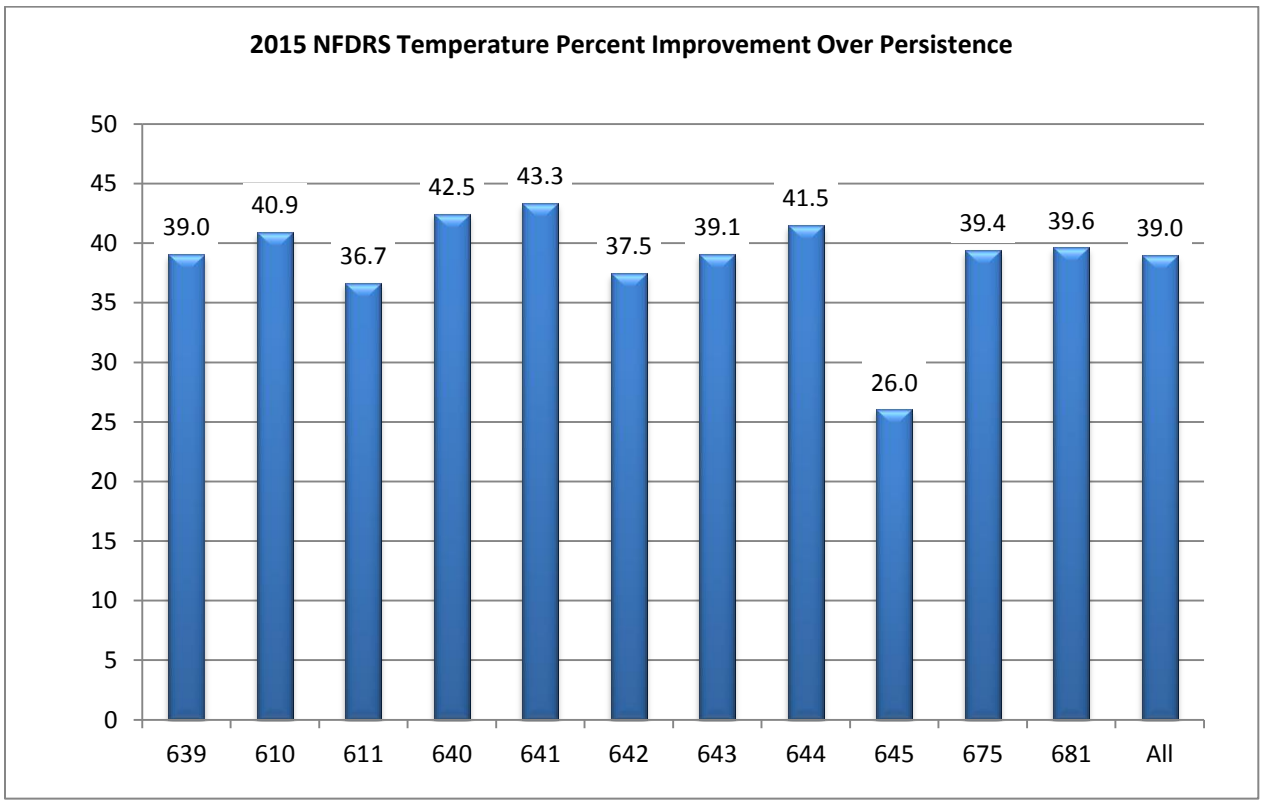
August 3-4	OR639, OR641, WA639, WA641, WA675	Wind/Low RH	Yes	39.40 hrs.
August 5	OR641, WA641, WA675	Wind/Low RH	No – WA675 Yes – All others	5.53 hrs.
August 9-11	All	Abundant Lightning	No – WA639, WA641, WA675, WA681, OR611 Yes – All Others	19.67 hrs.
August 14	WA639, WA641, WA675, OR639, OR641, OR642, OR644, OR645	Wind/Low RH	No – WA639, OR639 Yes – All Others	14.96 hrs.
August 19-20	All	Wind/Low RH	No – OR611 Yes – All Others	19.27 hrs.
August 23-24	WA643, WA645, WA681, OR642, OR643, OR644, OR645	Haines 5-6/Low RH	No – WA643, WA645, WA681 Yes – All Others	26.98 hrs.
August 24	OR641, WA641	Abundant Lightning	Yes	0.54 hrs.
August 28	OR640, OR641, OR642, OR643, OR644, OR645, WA641, WA643, WA645, WA675	Wind/Low RH	Yes	19.71 hrs.
September 12-13	OR639, OR640, OR641, WA639, WA641, WA675	Wind/Low RH	No – WA639, OR639, OR640 Yes – All Others	23.72 hrs.
				Average: 20.04 hrs.

	All Warnings	**Lightning**	**Synoptic (Low RH combined with Wind or Haines 6)**
Warnings Issued:	136	56	80
Verified Warnings:	105	39	66
Unverified Warnings:	31	17	14
Missed Warnings:	6	6	0
Probability of Detection:	0.95	0.87	1.00
False Alarm Ratio:	0.23	0.30	0.18
Critical Success Index:	0.74	0.63	0.83

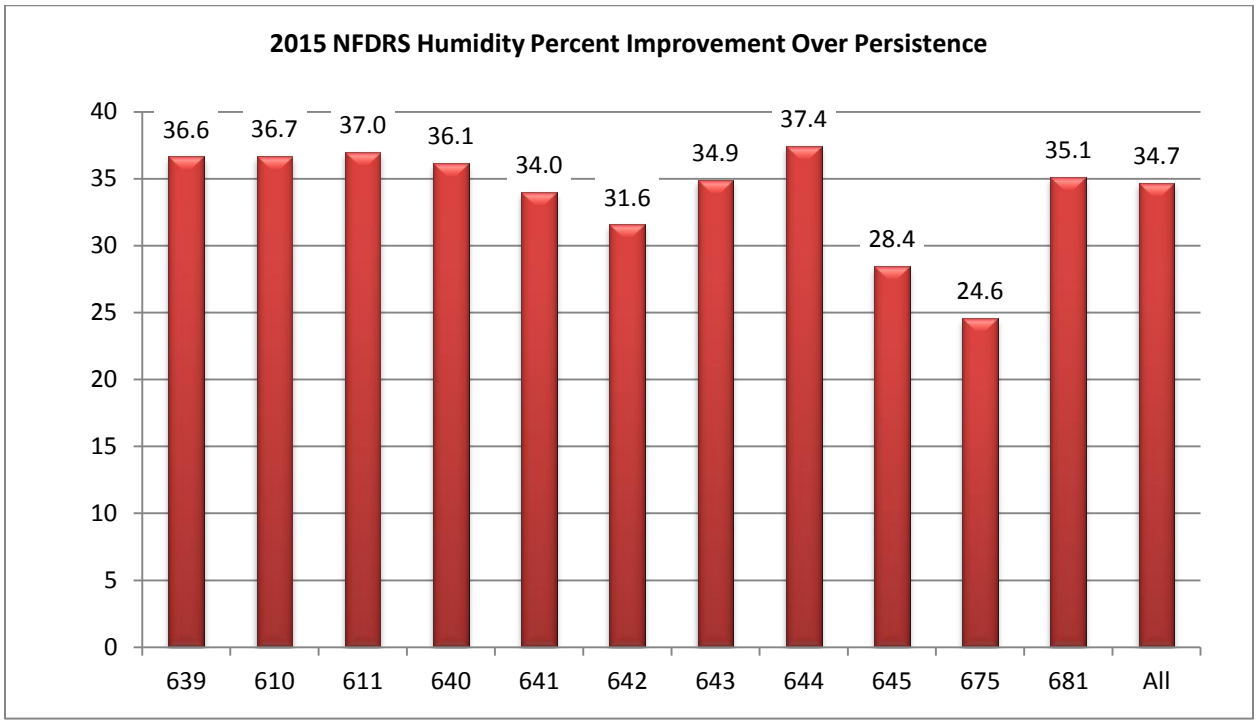
Note: For highest accuracy, False Alarm Rate (FAR) should approach 0.00 with Critical Success Index (CSI) and Probability of Detection (POD) nearing 1.00.

National Fire Danger Rating System Forecast Verification

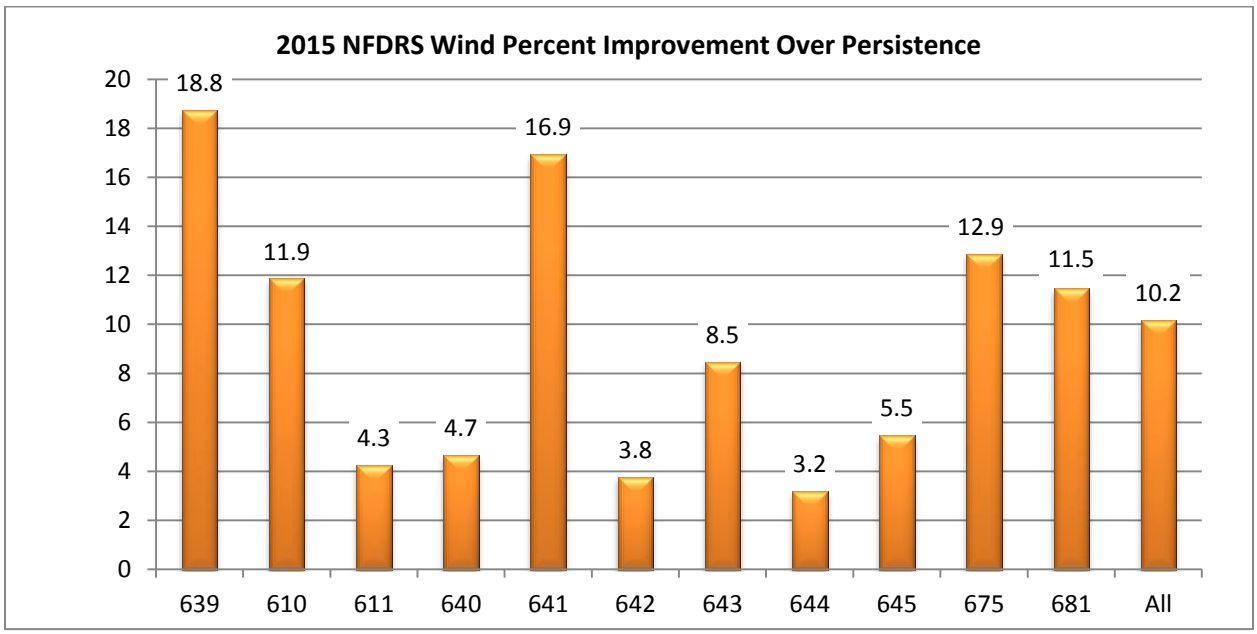
National Weather Service Offices provide input into the National Fire Danger Rating System via next day forecasts covering a variety of weather and weather related elements. Forecast comparisons against actual observations taken the following day at 1300 PST (1400 PDT) determine the amount of error with 1 point counted for each degree or mph of difference. The following charts show NWS Pendleton forecast percentage improvement over a persistence forecast for temperature, relative humidity, and wind speed averaged across each zone followed by the average of all stations in the final column. The June 1 through September 30 time frame is covered.



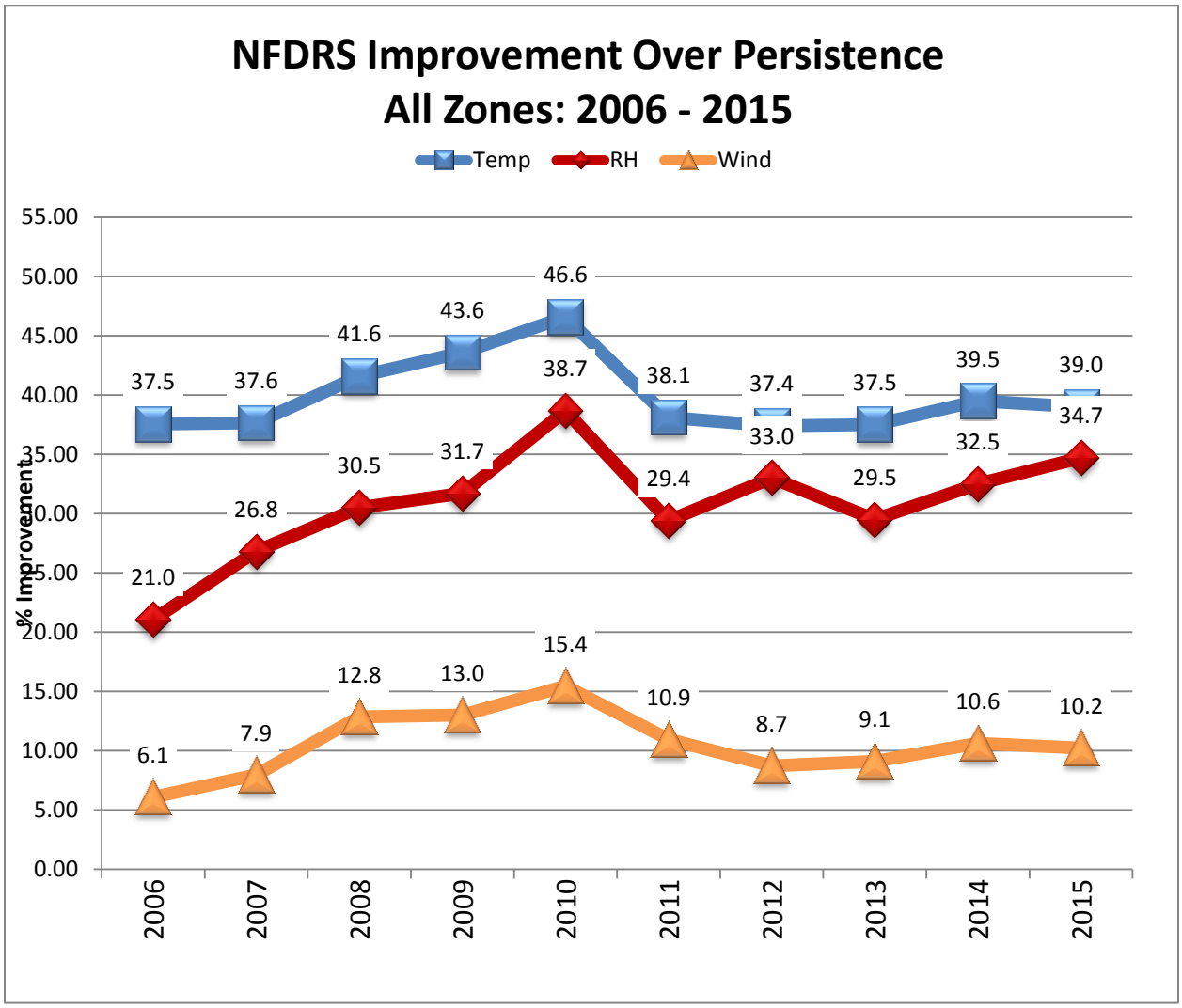
Temperature verification (above) for the entire Pendleton forecast area was similar to 2014 with a 39.0% improvement over persistence compared to 39.5% last year. The office goal is to maintain an improvement of 35% or greater which was accomplished in all but one zone this year.



Humidity verification (above) rose to 34.7% improvement over persistence this year compared to 32.5% in 2014. The office goal is to maintain an improvement of 25% or greater which was accomplished in all but one zone this year.

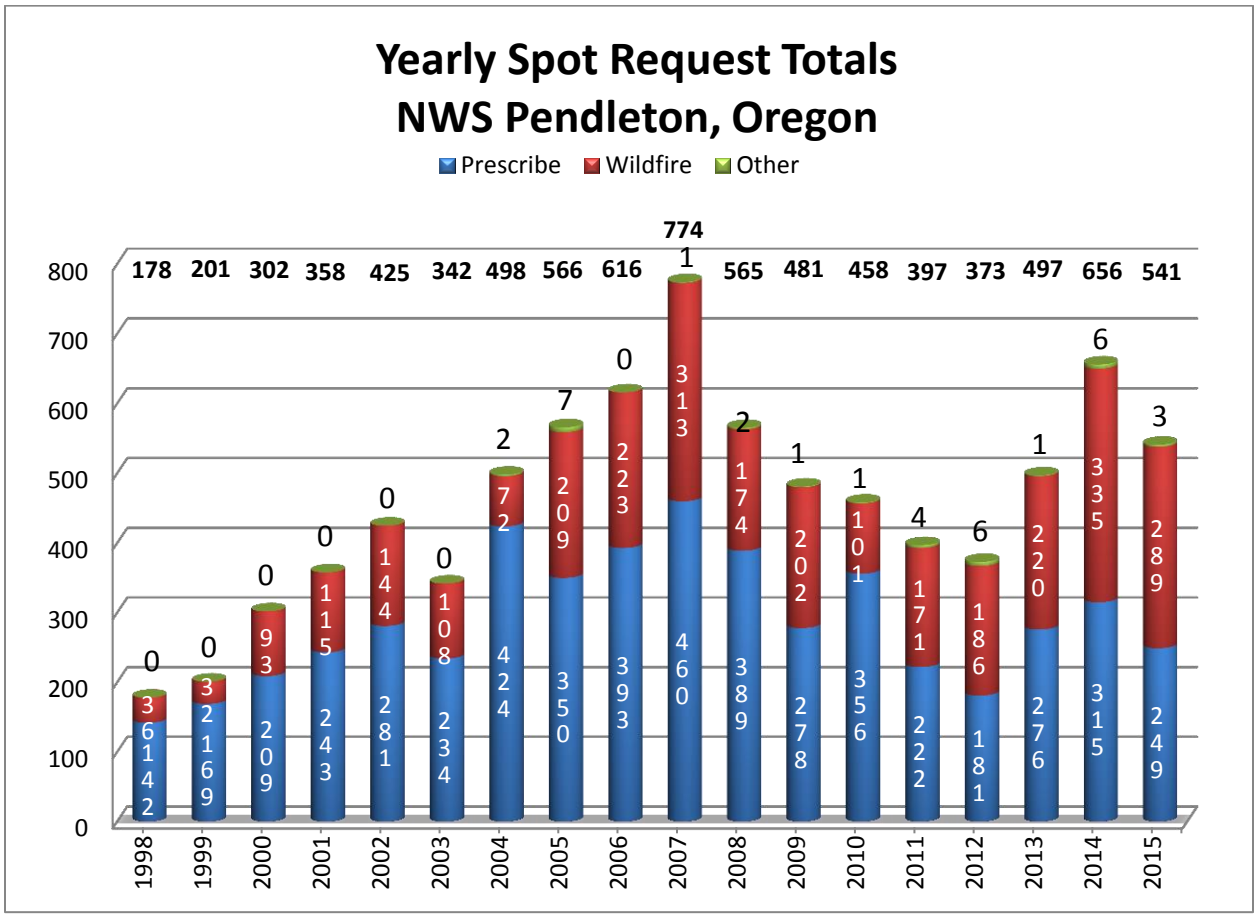


Overall wind verification (above) was similar to 2014 with a 10.2% improvement over persistence compared to last year's 10.6%. Our office goal is 10% improvement over persistence. As usual, there were few big change wind events for mountain zones and thus it was difficult to improve much over persistence.



10 year trend graph (above) showing forecast improvement over persistence for NFDRS forecasts. Overall, yearly NFDRS verification data and trends for the Pendleton office were showing a gradual improvement over persistence through 2010, but trended downward through 2012. Improvement over persistence has now been slowly trending back up in 2014 and 2015. Performance goals are improvements greater than 35% for temperature, 25% for relative humidity, and 10% for wind speed. Note: Technological improvements allowed NFDRS zone average trend forecasts to be switched to individual station trend forecasts in 2008. PDT fire weather zones changed in 2014 and some NFDRS stations were eliminated from the forecast package.

Spot Forecast Totals



The chart above shows the 18-year trend of spot forecasts issued by the Pendleton office. The total number of spot forecasts (541) issued by the Pendleton weather office this year is close to the 10-year average of 536. There were 249 prescribed burn spot forecasts (66 less than the previous year) and 289 wildfire spot requests (a decrease of 46 from 2014). It should be noted that for the second year in a row, there were more wildfire forecasts than prescribed burn forecasts, which also happened in 2012. There was also 1 hazmat spot forecast, 1 drill spot request, and 1 search and rescue spot forecast.

IMET dispatches

Incident Meteorologists (IMET) provide on-site support for a variety of incidents where weather forecast and monitoring information is essential to emergency responder safety. There were four IMET dispatches from NWS Pendleton this year for 54 days on incident. Assignments are listed below.

Dates	IMET	Incident	Location
6/29 – 7/5	Cobb	Sugarloaf Fire	Dayville, OR
7/5 – 7/14	Cobb	Corner Creek Fire	Dayville, OR
7/22 – 7/28	Cobb	Blue Creek Fire	Walla Walla, WA
8/10 – 8/25	Cobb	Gasquet Complex	Gasquet, CA
8/15 – 9/1	Wister	Route Complex (Trainee)	Mad River, CA

Training and Outreach Activity

Training and outreach continues to be an important part of the fire weather program at NWS Pendleton. The following table lists training and activities for 2015.

Date(s)	Forecaster	Activity	Location
2/7 – 2/8	Cobb	S-290 Heppner Fire Department	Heppner, OR
3/10	All Staff	Annual Office Fire Weather Pre-Season Seminar	Pendleton, OR
3/11	Cobb	Umatilla County Smoke Management Meeting	Pendleton, OR
3/19 – 3/20	Cobb/Bieda	Northwest Interagency Coordination Center AOP Meeting	Portland, OR
3/23 – 3/27	Cobb/Bieda	National Weather Service IMET Training	Remote Conference
4/22	Cobb/Bieda	RT-130 Annual Fireline Safety Refresher	Pendleton, OR
5/19 – 5/20	Cobb	S-290 Columbia River Gorge NSA	Cascade Locks, OR
6/14	Cobb	S-290 Washington National Guard	Yakima, WA
6/15	Cobb	S-190 Fire School Eastern Oregon University	LaGrande, OR
6/15	Bieda	S-190 Guard School John Day Interagency Dispatch	John Day, OR
6/16	Wister	RT-130 Annual Fireline Safety Refresher	Walla Walla, WA
6/19 – 6/20	Bieda	S-290 WADNR Fire Academy	Ellensburg, WA
6/23 – 6/24	Bieda	S-290 Blue Mountain Interagency Dispatch Center	LaGrande, OR
10/8	Cobb	Fire Weather Presentation for Condon High School	Condon, OR
12/1	Wister/Murphy	Oregon Department of Forestry Fire Seminar	John Day, OR